

Amendments to the Claims:

This Listing of Claims will replace all prior versions and listings of claims in the application:

Listing of Claims:

1. (currently amended) A system for optimizing data access, comprising:
a file server capable of communicating with one or more clients; and
a plurality of storage elements organized into pairs for storing a plurality of files, each pair having a master storage element and at least one or more mirrored storage elements, and each mirrored storage element having a copy of data stored on the master storage ~~elements~~element;

wherein the file server maintains file information on where each of the plurality of files is stored on which pair of storage ~~elements~~elements, and ~~wherein the file server further maintains access load information regarding each one of the~~ on each pair of storage elements; and

wherein when a client requests file information for a requested file from the file server, the file server determines which pair of storage elements has the requested ~~file~~ file, and further determines which of the storage elements within the pair of storage elements having the requested ~~file~~ file, is to be accessed based upon use of the storage system.

2. (original) The system according to claim 1 wherein the plurality of storage elements is a plurality of disk drives.

3. (currently amended) The system according to claim 1 wherein the plurality of storage elements are provided in ~~stored on~~ a single storage system.

4. (currently amended) The system according to claim 1 wherein the plurality of storage elements are provided in at least two ~~stored on one or more~~ storage systems.

5. (original) The system according to claim 1 further comprising:
a plurality of host computers;

wherein the file server resides on one of the plurality of host computers; and
wherein the one or more clients reside on remaining ones of the plurality of
host computers.

6. (currently amended) The system according to claim 1 further comprising:
~~_____ a syne daemon comprising apparatus~~ configured to synchronize data stored on
each pair of storage elements.

7. (currently amended) The system according to claim 1 wherein the master
storage element and the at least one storage element ~~one or more mirrored storage elements~~
within a pair are contained in ~~stored on~~ a single storage system.

Claim 8 (canceled).

9. (currently amended) The system according to ~~claim 8~~ claim 1 wherein if it
is determined that a mirrored storage element is to be accessed for the requested file and the
mirrored storage element which is to be accessed contains a latest copy of data for the
requested file stored on the corresponding master storage element, the client directly retrieves
the requested file from the mirrored storage element.

10. (currently amended) The system according to ~~claim 8~~ claim 9 wherein if
it is determined that a mirrored storage element is to be accessed for the requested file and the
mirrored storage element which is to be accessed does not contain a latest copy of data for the
requested file stored on the corresponding master storage element, the latest copy of data for
the requested file stored on the corresponding master storage element is retrieved from the
corresponding master storage element and then forwarded to the client.

11. (original) The system according to claim 1 wherein the file information
on where each of the plurality of files is stored on which pair of storage elements includes file
allocation lists.

12. (currently amended) The system according to claim 1 wherein when determining which of the storage elements within the pair of storage elements having the requested file is to be accessed, consideration is given to ensure that all the storage elements within the pair of storage elements having the requested file are ~~substantially~~ accessed in a substantially balanced manner.

13. (original) The system according to claim 1 wherein upon determining which of the storage elements within the pair of storage elements having the requested file is to be accessed, the file server forwards information relating to the determination to the client thereby allowing the client to retrieve the requested file from the determined storage element.

14. (original) The system according to claim 13 wherein upon forwarding the information relating to the determination to the client, the file server updates the access load information to ensure accurate monitoring of access balance of the pairs.

15. A system for optimizing data ~~access~~, access comprising:
a first host computer having a file system server, the first host computer capable of communicating with a second host computer having a file system client; and
a storage system having a plurality of disk drives organized into pairs for storing a plurality of files, each pair having a master disk drive and at least one ~~one or more~~ mirrored disk ~~drives~~drive, each mirrored disk drive having a copy of data stored on the master disk drive;

wherein the file system server maintains file information on where each of the plurality of files is stored on which pair of disk ~~drives~~;

~~wherein the file system server~~ drives and further maintains access load information on each pair of disk drives; and

wherein when a file system client requests file information for a requested file from the file system server, the file system server determines which pair of disk drives has the requested file and further determines which of the disk drives within the pair of disk drives having the requested file is to be accessed based upon use of the storage system.

16. (original) The system according to claim 15 wherein the file information on where each of the plurality of files is stored on which pair of disk drives includes file allocation lists.

17. (currently amended) The system according to claim 15 wherein when determining which of the disk drives within the pair of disk drives having the requested file is to be accessed, consideration is given to ensure that all the disk drives within the pair of disk drives having the requested file are ~~substantially~~-accessed in a substantially balanced manner.

18. (original) The system according to claim 15 wherein upon determining which of the disk drives within the pair of disk drives having the requested file is to be accessed, the file system server forwards information relating to the determination to the file system client thereby allowing the file system client to retrieve the requested file from the determined disk drive.

19. (original) The system according to claim 18 wherein upon forwarding the information relating to the determination to the file system client, the file system server updates the access load information to ensure accurate monitoring of access balance of the pairs.

20. (currently amended) A system for optimizing data access, comprising:
a first host computer having a file system server, the first host computer capable of communicating with a second host computer having a file system client; and
a plurality of storage systems, each of the plurality of storage systems having a plurality of disk drives, the plurality of disk drives from the plurality of storage systems being ~~are~~ collectively organized into pairs for storing a plurality of files, each pair having a master disk drive and at least one ~~one or more~~ mirrored disk ~~drives~~drive, each mirrored disk drive having a copy of data stored on the master disk drive;

wherein the file system server maintains file information on where each of the plurality of files is stored on which pair of disk ~~drives~~;

~~wherein the file system server~~ drives and further maintains access load information on each pair of disk drives; and

wherein when a file system client requests file information for a requested file from the file system server, the file system server determines which pair of disk drives has the requested file and further determines which of the disk drives within the pair of disk drives having the requested file is to be accessed based upon use of the storage system.

21. (original) The system according to claim 20 wherein the file information on where each of the plurality of files is stored on which pair of disk drives includes file allocation lists.

22. (currently amended) The system according to claim 20 wherein when determining which of the disk drives within the pair of disk drives having the requested file is to be accessed, consideration is given to ensure that all the disk drives within the pair of disk drives having the requested file are ~~substantially~~-accessed in a substantially balanced manner.

23. (original) The system according to claim 20 wherein upon determining which of the disk drives within the pair of disk drives having the requested file is to be accessed, the file system server forwards information relating to the determination to the file system client thereby allowing the file system client to retrieve the requested file from the determined disk drive.

24. (original) The system according to claim 20 wherein upon forwarding the information relating to the determination to the file system client, the file system server updates the access load information to ensure accurate monitoring of access balance of the pairs.

25. (original) The system according to claim 20 wherein if it is determined that a mirrored disk drive is to be accessed for the requested file and the mirrored disk drive which is to be accessed contains a latest copy of data for the requested file stored on the corresponding master disk drive, the file system client directly retrieves the requested file from the mirrored disk drive.

26. (original) The system according to claim 20 wherein if it is determined that a mirrored disk drive is to be accessed for the requested file and the mirrored disk drive which is to be accessed does not contain a latest copy of data for the requested file stored on the corresponding master disk drive, the latest copy of data for the requested file stored on the corresponding master disk drive is retrieved from the corresponding master disk drive and then forwarded to the file system client.

27. (currently amended) A method for optimizing data ~~access~~, access comprising:

organizing a plurality of storage elements into pairs for storing a plurality of files, each pair having a master storage element and at least one ~~one or more~~ mirrored storage elements, and ~~each~~ each mirrored storage element having a copy of data stored on the master storage element;

maintaining file information on where each of the plurality of files is stored on which pair of storage elements;

maintaining access load information on each one of the pair of storage elements; and

upon receiving a request for a requested file, determining which pair of storage elements has the requested file ~~by using the file information~~, and then determining which of the storage elements within the pair of storage elements having the requested file is to be accessed by using the access load information.

28. (currently amended) The method of claim 27 further ~~comprising~~ comprising upon determining which of the storage elements within the pair of storage elements having the requested file is to be accessed, forwarding information relating to the determination to a client thereby allowing the client to retrieve the requested file.

29. (currently amended) The method of claim 28 further ~~comprising~~ comprising upon forwarding the information relating to the determination to the client, updating the access load information to ensure accurate monitoring of access balance of the pairs.

30. (original) The method according to claim 27 wherein the plurality of storage elements are stored on a single storage system.

31. (currently amended) The method according to claim 27 wherein the plurality of storage elements are stored ~~on one or more storage systems.~~ in at least one storage system.

32. (currently amended) The method according to claim 31 further ~~comprising:~~comprising upon determining that a mirrored storage element is to be accessed for the requested file and the mirrored storage element which is to be accessed contains a latest copy of data for the requested file stored on the corresponding master storage element, retrieving the requested file from the mirrored storage element directly.

33. (currently amended) The method according to claim 31 further ~~comprising:~~comprising upon determining that a mirrored storage element is to be accessed for the requested file and the mirrored storage element which is to be accessed does not contain a latest copy of data for the requested file stored on the corresponding master storage element, retrieving the latest copy of data for the requested file stored on the corresponding master storage element from the corresponding master storage element.

34. (original) The method according to claim 27 wherein when determining which of the storage elements within the pair of storage elements having the requested file is to be accessed, consideration is given to ensure that all the storage elements within the pair of storage elements having the requested file are substantially accessed in a balanced manner.

35. (original) The method according to claim 27 wherein the plurality of storage elements includes a plurality of disk drives.

36. (currently amended) A method for optimizing data access between a file server and at least one or more ~~clients,~~ clients comprising:

organizing a plurality of disk drives into pairs for storing a plurality of files, each pair having a master disk drive and at least one ~~one or more~~ mirrored disk ~~drives~~drive, and each mirrored disk drive having a copy of data stored on the master drive;

maintaining file information on where each of the plurality of files is stored on which pair of disk drives;

maintaining access load information on each pair of disk drives, wherein the file information and the access load information are maintained at the file server;

upon the file server receiving a request for a requested file from a client, causing the file server to determine which pair of disk drives has the requested file by using the file information, and then causing the file server to determine which of the disk drives within the pair of disk drives having the requested file is to be accessed by using the access load information; and

forwarding information relating to the determination as to which of the disk drives within the pair of disk drives having the requested file is to be accessed to client thereby allowing the client to retrieve the requested file.